the action of the organising committee. We do not look to such meetings to produce any contribution to knowledge, but rather to express an attitude of mind and to set an example of a right method of approach to the vexed questions of the day. The eminently sane and statesmanlike influence of the Archbishop of York was felt throughout the proceedings, and his opening address contained an excellent summary of the ground to be traversed in these meetings of the Congress, and indicated the point of view from which he desired that it might be surveyed.

The papers and discussions on town planning and rural housing showed signs of a healthy realisation of the economic aspects of that question. Cottages never will and never ought to be built in any number and let at rents less than their true economic value. Such a course of action, from whatever motives it be adopted, leads in the end to a depreciation of wages. It is, in fact, a return by a circuitous route to the old and evil plan of a subsidy to wages through a widespread extension of a method of outdoor relief—a system which, under the old ante-1834 Poor Law, proved to be pauperisation in one of the worst forms. Only when it is realised that, as Mr. Raymond Unwin declared was already the case, it pays to provide good housing accommodation and that garden villages are a better form of investment than potential slums shall we see the end of the long series of lamentable mistakes in housing, some of which have recently been perpetrated afresh in connection with the opening up of the new industrial areas at Doncaster and Dover.

The question of the falling birth-rate, a fall which is very marked in the manufacturing cities of the northern provinces, wherever women are employed in factories, was dealt with by Mr. W. C. D. Whetham, F.R.S., who again emphasised the frequent opposition in present circumstances between the economic and the religious aspect of normal family life. The Church of England, unlike the Church of Rome, has not yet grasped the fact that the number and quality of her future members, indeed, her very corporate existence, can be made the plaything of social, industrial, and moral forces with which she has neglected to concern herself.

From the academic point of view, the most interesting morning was that devoted, on Thursday, to a discussion of the relation of miracles to the Christian faith, a contribution towards the age-long effort to reconcile intuitive belief and intellectual reason and to assign to each their true importance in the religious life. The subject was opened by the Dean of Christ Church (Dr. Strong) with an admirable attempt to determine how far, in the light of all knowledge at present available, it was practicable to answer the question: "Are miracles possible at all?" The Dean gave an excellent account of modern thought relating to the purely mechanical theory of life, which would regard the world as a closed system, controlled by unerring laws of matter and motion, and in which the appearance of a miracle could only be explained as the result of imperfect observation or incorrect deduction. But he pointed out that recent tendencies, both in philosophy and biology, would seem to lead away from and not towards the acceptance of such a mechanical view of nature as the complete and ultimate solution of the whole problem of existence and consciousness.

Prebendary Webb-Peploe's contribution, which was much applauded, served to remind us that for those people who are prepared to adopt intact into their theological belief the experiences attributed to Job, Daniel and Jonah, the efforts of learned professors and others to alleviate their lot are both officious and ill-judged. The discussion was closed by the Archbishop, who referred to some of the papers read at the recent meeting of the British Association for the Advancement of Science, held at Dundee, and concurred with the Dean that at the present moment it was the mechanical theory of the universe, quite as much as the miraculous basis of Christianity, that was on its trial in the world of thought. His Grace's closing sentences, as reported in *The Times,* may perhaps be given to sum up the general trend of the whole discussion. "The real meaning of the miraculous was that it was an assurance given to them that, ultimately, the Divine Being was free and master in His own house; and it was the coming forth of that fact into the world that carried with it the consequences that they called miracles."

NOTES.

THE meeting to be held at the Mansion House on October 23, in connection with the proposed memorial to the late Lord Lister, is the outcome of a movement which was set on foot by the presidents of the Royal Society and the Royal College of Surgeons. A large and influential committee has been formed, representative of scientific, medical, and general interests, both in this country and abroad, and the various possible schemes, including a memorial in Westminster Abbey, and others of an international character, will be laid before the meeting, which it is hoped will be largely attended.

THE Royal Microscopical Society has arranged to hold a conversazione at King's College, London, on Wednesday, October 16, from 8 to 11 p.m.

THE extension to the Manchester Museum will be opened on the afternoon of Wednesday, October 30, by Mr. Jesse Haworth. An address will be delivered by Prof. W. M. Flinders, F.R.S.

MR. E. GRANT HOOPER, superintending chemist, Government Laboratory, and vice-president of the Society of Chemical Industry, has been appointed Deputy-Government Chemist, in succession to Mr. H. W. Davis, who has retired.

SIR GEORGE DARWIN, K.C.B., F.R.S., Plumian professor of astronomy at Cambridge, who, we regret to learn, has been ill for two or three weeks, underwent a severe operation on Thursday last. On Sunday he spent a bad night, but we are glad to be able to state that he is now making good progress.

THE Home Secretary has appointed a committee to inquire and report as to the precautions necessary in the use of celluloid in manufacture and the handling and storage of celluloid and celluloid articles. The members of the committee are:—The Earl of Plymouth (chairman); Prof. J. J. Dobbie, F.R.S., principal Government chemist; Captain M. B. Lloyd; Mr. H. M. Robinson, Deputy Chief Inspector of Factories; and Mr. E. O. Sachs, chairman of the executive of the British Fire Prevention Committee.

WE notice with regret the announcement of the death on Sunday, October 6, at seventy-six years of age, of Prof. W. W. Skeat, professor of Anglo-Saxon in the University of Cambridge, and of world-wide distinction among philologists. In his early years he showed talent in mathematical studies, and he took his degree at Cambridge in the Mathematical Tripos, where he was placed as fourteenth Wrangler in 1858. After a few vears spent in country curacies, he returned to Cambridge in 1864, and was appointed a mathematical lecturer at his own college, Christ's. He then commenced the etymological studies represented in the long series of publications upon the English language which forms an imposing monument to his knowledge and industry.

THE third International Archæological Congress was opened in Rome on Wednesday, October 9. We learn from *The Morning Post* that no fewer than twenty-four Governments are officially represented, but the British Government is absent from the list, though one department—the Board of Education—is represented by Dr. Ashby, the resident director of the British School at Rome. British universities and other learned societies, however, are well represented. The congress will be divided into twelve sections, according to subjects. Among the themes to be discussed are:—The Iron age in Italy, the prehistoric civilisation of Sardinia, the monuments of Egypt and Asia, Minoan civilisation, the origins of Etruscan culture, the territories of the old Italian cities, Roman epigraphy, numismatics, the roads of the Roman Empire, and the question of archæological bibliography.

AN interesting and important step towards systematised nature-protection has been taken by the Royal Society for the Protection of Birds. This is the taking over of the remarkable Somerset headland, Brean Down. For permission to establish this sanctuary the society is indebted to the wisdom of the Somerset County Council, the action of which may well form a precedent for county councils throughout the kingdom. The society has the "shooting rights," and has appointed a watcher, but the general maintenance of the place will depend largely on the support given to the society. Subscriptions for this or other work of the society may be sent to the secretary, 25 Queen Anne's Gate, S.W. The joint action of local governing bodies, of protection societies, and of private individuals is the kind of method that should succeed in this country. "Our Dumb Friends' League" will hold a meeting at the Whitehall Rooms on October 15, at which Mr. James Buckland, the promoter of the Plumage Bill, Colonel Sir Mark Lockwood, M.P., and Mr. George Greenwood, M.P., will speak. The Ranee of Sarawak will preside. Brean Down is a bare grassy promontory with broken cliffs. It is well known to botanists as a habitat of the white rock rose. Its chief bird—there are three specially protected—is the beautiful sheldrake. Of the other two, the raven has built here for fifty years. Lately the peregrine, so often found near the raven, has established itself. Mr. Harry Cox, to whose zeal the new sanctuary mainly owes its institution, last year rescued the only young one. Kingfishers, sparrow-hawks, daws, kestrels, shrikes, linnets, rock-pipits, and wheat-ears are also natives.

THREE important plaster casts have been added to the exhibition of fossil reptiles in the department of geology in the British Museum (Natural History). A copy of the skull of the gigantic carnivorous dinosaur, *Tyrannosaurus rex*, is interesting for comparison with the fragmentary remains of Megalosauria found in England. The original specimen was obtained by the American Museum of Natural History from the Upper Cretaceous (Laramie Formation) of Montana, U.S.A., and as it measures no less than 4 ft. in length, the carnivore to which it belonged would be able to prey on the contemporaneous herbivorous dinosaurs, Trachodon and Triceratops. A copy of the skeleton of a pterodactyl, with large slender teeth, lately discovered bv Mr. B. Hauff in the Upper Lias of Würtemberg, shows again how completely developed were the flying reptiles even in the early part of the Jurassic period. A cast of a nearly complete skeleton of the Permian labyrinthodont, *Archegosaurus decheni*, in the museum of the Prussian Geological Survey at Berlin, is a useful acquisition in view of the researches now in progress concerning the origin of reptiles and their connection with amphibians.

BY the tragic death of George Herbert Grosvenor, who was drowned at Polzeath on September 4, whilst endeavouring to save the life of a friend, biology has lost one of the most promising of her younger workers. After a brilliant career at Harrow, Mr. Grosvenor was elected to a biological exhibition at New College, Oxford, subsequently taking a first in his Final School. Elected to the Oxford table at Naples, he confirmed, by a brilliant piece of work, Strethill Wright's almost forgotten suggestion that the nematocysts of Æolids were derived from their prey. His work was awarded the Rolleston prize in 1904. On his return to Oxford he became busily engaged in founding a new school of economic entomology, and with his characteristic thoroughness had acquired a wide knowledge of insects. His regular work left him but little time for research, though it is hoped that the results of some of his investigations may yet be published. Of his great personal charm this is not the place to speak. He combined an exceptional power of concentration and clearness of thought with a singularly modest and retiring disposition, and his loss will be long and deeply felt by those whose good fortune it was to be his associates.

THE statue of Captain James Cook presented to the town of Whitby by the Hon. Gervase Beckett, M.P., which was unveiled on October 2, will be welcomed as a fitting memorial to a man who succeeded, where many others had failed, in laying open the secrets of the Pacific Ocean, thanks mainly to inborn determination and courage. Cook was not a man of many or varied attainments. He was born of lowly parents, and from his earliest years his whole energy was directed towards perfecting himself in the work of his calling on the sea. The same energy and stedfastness of purpose, joined to his temperance and his mastery of every detail of his profession, enabled him to carry through the journeys which elucidated the questions as to the amount and extent of the lands in the Southern Ocean, the answer to which had eluded so many less competent and persevering explorers. It is on his work as a voyager and discoverer that Cook's chief claim to fame is based, but the fact that he was the first to take scientific preventive measures against scurvy, the disease which has wrecked the hopes of so many explorers, earned him the gratitude of voyagers. It was for his splendid work in this direction that he was unanimously elected a fellow of the Royal Society after his return from his second voyage in 1775. On this he had kept the sea for three years, and but one of his crew of 118 men was lost.

IN the report of the Rhodesia Museum—which is now under the joint control of the Bulawayo municipality and the Rhodesia Scientific Association—for 1911, it is stated that the building opened by H.R.H. the Duke of Connaught in 1910 is already well-nigh filled, and that proposals for enlargement are already under consideration. There is the usual complaint as to the insufficiency of funds, even for ordinary purposes.

THE hundredth volume of the *Zeitschrift für wissenschaftliche Zoologie* was completed with the part published on June 25 last, and already three parts of the hundred and first volume have appeared since that date. The degree of elaboration to which it is possible to bring the study of invertebrate anatomy is well illustrated in recent volumes of this valuable series. The last part issued (vol. ci., part 3) contains the first continuation of the fifth part of Dr. Friedrich Voss's memoir on the thorax of the domestic cricket, and this continuation alone contains no fewer than 134 pages. Truly the accumulation of detailed information with regard to the animal kingdom goes on at a great rate, especially in Germany.

CANADA, it appears from the report of the Commissioner of Dominion Parks for 1911, published by the Government Printing Bureau at Ottawa, now possesses seven public parks in which native animals are preserved. Some of these, which contain hotels and medicinal baths, are to a great extent self-supporting, and all are stated to be making rapid and satisfactory progress. In the Rocky Mountain Park at Banff, where the use of firearms, save in exceptional circumstances, is prohibited, the animals are becoming increasingly tame, deer visiting the lawns of the residences, and bighorn sheep wintering within half a mile of the Pacific Railway. The bison (buffalo) in the Buffalo Park at Wainwright are in a thriving condition, and promise a large natural increase in the future.

THE last report of the Madras Museum records steady progress in the arrangement of this important collection and in the acquisition of new specimens. The great series of bronze images has been re-classified, and a considerable number of fresh copper plates has been added. The numismatic department has received large additions in the shape of pagodas, fanams, and six Venetian sequins. Among the accessions to the natural history collections may be mentioned the first Indian specimen of Swinhoe's snipe (*Gallinago megala*), shot recently in the Chingleput district, a bird which breeds in Eastern Siberia and Northern China, and migrates in the cold season to Southern China and the Malay Peninsula, the few existing specimens having been procured from the Malay Peninsula, Burma, and Assam.

IN the August number of *The National Geographic Magazine*, Mr. Carl E. Akeley narrates, with a great wealth of photographic illustration, his experiences during an expedition to East Africa for the purpose of obtaining a series of elephants to form a group in the American Museum of Natural History. The main note of the article is the growing scarcity of old bulls with tusks of more than 50 lb. in weight. The best specimen obtained was a young bull standing 11 ft. 3 in. at the shoulder, with tusks weighing respectively 100 and 102 lb. These tusks were comparatively young ivory, and it is estimated that if the animal had been suffered to live another fifty years it would have developed tusks of something like 200 lb. weight, such tusks being by no means abnormal, but merely the ordinary development of mature bulls of the Uganda race. When, however, a bull grows tusks of 50 lb. weight, which he does in about twenty-five years, he becomes the target of every hunter in the country, and it is consequently only a few individuals, which obtain protection by living amid large herds of cows or in dense forests, that can attain full maturity. Large tusks must therefore become very rare in the near future. Attention is also directed to the damage to forests and cultivation due to herds of elephants from which tuskers have been killed off, damage which may lead to reprisals from proprietors as the country becomes opened up.

THE forty-third annual report of the American Museum of Natural History for the year 1911 begins by recording that the trustees have resolved to complete the building of the southern half of the museum in time for the celebration of the jubilee in 1919. Special halls will thus be provided for whales, fishes, oceanography, and geography, while numerous rearrangements for the more adequate display of the collections will be possible. With characteristic energy, and with the aid of private benefactions, the museum employed no fewer than forty-four parties for the collection of specimens in various parts of the world. It is, therefore, making haste to rival in opportunities for natural history research the older foundations, the growth of which has been more gradual. Among notable accessions thus obtained during 1911 may be mentioned mammals and birds from Lower California and the northern part of South America, invertebrates from the West Indies and British Guiana, fossil mammalian remains from Cuba, and a glacial pot-hole from St. Lawrence County, New York. The Williston collection of tropical Diptera was also purchased. Among new exhibits illustrated in the report, the group of skeletons of extinct ground-sloths from South America is especially important, while a set of restored models of Devonian fishes arranged in the form of an aquarium is at least striking. Probably on account of the intimate association of the museum with elementary education, most of the exhibits seem to be more pictorial in character than those to which we are accustomed in European museums. The American museum is to be congratulated on being able at the same time to occupy a foremost place in the advancement of knowledge by its valuable publications.

Mr. L. L. Woodruff (Proc. Soc. Experimental Biology and Medicine, vol. ix., p. 121) has now continued his pedigreed culture of the common ciliate infusorian, *Paramoecium aurelia,* for five years. The culture was started in May, 1907, with a wild individual isolated from a laboratory aquarium. From the progeny of this specimen individuals have been isolated practically daily, and cultivated in sterilised infusions of hay and other vegetable substances. During the five years to May, 1912, 3029 generations have been produced without any conjugation having taken place, and the organisms are still in as normal condition, both morphologically and physiologically, as the original wild ancestor. The author concludes that the original individual cell possessed the potentiality of producing descendants the number of which is represented by at least 2 raised to the 3029th power, and that senescence and the need of fertilisation are not primary attributes of living matter.

In No. 6 of the Kew Bulletin, Mr. W. J. Bean gives an extremely interesting account of various gardens and parks in South Europe, including the famous garden at La Mortola, the acclimatisation garden at Hyères, the Villa Thuret and Eilen Roc gardens at Cap d'Antibes, and the fine gardens at Milan, Pallanza, Florence, Naples, Bologna, Padua, and various towns on the Adriatic coast. These notes, based on a tour made by the author in early summer of this year, should prove most useful to botanists who may wish to visit Italy and the adjacent parts of South Europe. The same number contains descriptions and plates of two recent additions to the Kew collection—a spurge (*Euphorbia meloformis*) and a cycad (*Cycas Micholitzii*). The former is one of the most remarkable South African spurges, and bears such a striking resemblance to *Echinocactus* that a non-botanist would never suppose that they belonged to two totally different families of plants.

Dr. R. R. Gates, who has contributed so much to the recent literature of mutation by his cytological work on Œnothera, describes in *The New Phytologist* (vol. xi., No. 2) a peculiar development which occurred in his cultures of evening primroses obtained originally from the Lancashire coast. In some of the forms the stem internodes remained undeveloped, though growth continued and new cycles of rosette leaves were continually added above while the older ones died away below. In this way a stem was produced which was covered with leaf-bases and bore a crown of leaves at the top, giving a striking resemblance to a cycad. From these and other forms it is hoped by further work to learn something more regarding the manner of origin of the various Œnotheras, and in particular to analyse the De Vriesian factor of evolution and ascertain in how far it is merely a process of hybrid-splitting and in how far it is a more deep-seated germinal disturbance—resulting in part from effects of previous crossing, from the direct influence of changed environment, or from some internal and unknown cause.

Mr. Neil E. Stevens has sent us a reprint of his recent paper (*Botanical Gazette,* April, 1912) on the cytology of heterostyled plants, containing observations on buckwheat and *Houstonia coerulea.* Zoologists have shown that in various insects the sperms are of two kinds, equal in number, and differing in respect of one or more of their chromosomes, and it has been shown that fertilisation of the eggs by one kind of sperm produces males, by the other kind females. This remarkable discovery has suggested the possibility of a similar condition in other organisms having separate sexes, but so far no evidence of such a "sex determinant" has been obtained in diœcious plants. In buckwheat, Stevens finds that in the mitosis of the pollen mother-cells the chromosomes of the short-styled form are much larger than in the long-styled form, also that there is a characteristic and constant difference in the arrangement of the chromosomes at one stage (anaphase) of the reducing nuclear division. In *Houstonia coerulea* the difference in size of the chromosomes is less marked, and there is apparently no difference in arrangement.

In our issue of July 25 we referred to a useful series of wind charts relating to the monsoon area of the North Indian Ocean, published by the U.S. Weather Bureau. This has been supplemented in its meteorological chart of the Indian Ocean for October by an interesting discussion, "Weather of India and her Seas," by the same writer (Mr. W. E. Hurd). He points out the close connection between the meteorology of India and the adjacent seas. Apart from the seasonal effects of insolation, the weather is directly associated with the distribution of atmospheric pressure in various regions, the changes in which produce the summer and winter monsoons. The writer traces the effects of these over various districts in a clear and instructive manner, some of the data being naturally drawn from the records of the Indian Meteorological Department. In the October charts of the North Atlantic and North Pacific oceans the Weather Bureau directs attention to recent alterations in the Act regulating wireless telegraphy, one provision of which enacts that no vessel licensed to carry fifty or more persons shall leave the shores of the United States from October 1 unless equipped with efficient apparatus for radio-communication, to be used during day and night, and capable of transmitting and receiving messages over a distance of at least one hundred miles.

In "Relative Bestimmungen der Intensität der Schwerkraft" (Karlsruhe: G. Braun), Dr. E. Becker gives the results of a series of pendulum experiments conducted during the years 1900–05 in Alsace-Lorraine. The work of the group of experimenters concerned appears to have been very carefully performed and the reductions of the observations have been carried out with a due recognition of the systematic errors likely to be present. Using Helmert's system of corrections to sea-level and giving to the ideal surface layer of land a density of 2·4, the experimenters find the western Rhine valley to be a region where gravity has its normal value. In general the higher land to the west is a region of gravity-excess. The map which accompanies the work would enable the reader to make a more intelligent use of the tabulated results if by shading or otherwise it gave an idea of the level contours or of the geological distribution. That would at once confirm or disprove the idea left by the table that no marked correlation between gravity-variation and height or geological conditions has been found. Another useful addition to the work would have been some illustrations of the apparatus used and described. It is to be hoped that the experiments will be extended as suggested in the last sentence of the memoir.

The volume of Contributions from the Jefferson Physical Laboratory of Harvard University for the year 1911 extends to nearly 400 pages, and contains eight memoirs, several of which we have already noticed in these columns. More than half the present volume is occupied by the important papers of Bridgeman on the properties of water and of mercury at pressures up to 20,000 kilogrammes per square centimetre, and at temperatures between −80° and +80° C. In addition to the new information these papers supply as to the various modifications of ice and the conditions of equilibrium amongst them, they show that the laws of change of state from solid to liquid are much simpler than the theories and observations of Tammann and of van Laar have led us to believe. Each melting point, for instance, changes with pressure in the same direction at these great pressures as it does at lower pressures, so that there is no maximum melting point in the case of mercury or minimum in the case of water. It seems probable that the maxima observed by Damien were due to slight impurities, too small to have observable effects on the melting points at low pressures, but which appear to have considerable effects at these high pressures.

A copy has been received of the third edition of "The Record of the Royal Society of London," prepared in connection with the celebration of the 250th anniversary of the foundation of the society. The volume, which may be obtained of Mr. Henry Frowde, Amen Corner, E.C., price 15*s*. net, is much larger and more complete than previous editions, and is a valuable official statement of the development and position of our leading society for the promotion of natural knowlege. The chapter of greatest general interest is that with which the volume opens, on the foundation and early history of the society. This has been re-written by the president, Sir Archibald Geikie, who has also supervised and edited the whole work. The three charters are printed in full, with translations, while other chapters are devoted to the statutes, trusts, benefactions, medallists, committees, and like matters. There is a chronological register of fellows, as well as an alphabetical list, with dates of election. The volume is illustrated by twenty excellent plates, mostly from portraits of former fellows in the society's possession. Among the additions to the new edition are portraits of Lord Kelvin, Lord Lister, and Charles Darwin. The officers and the clerical staff have been successful in producing an attractive volume of more than domestic interest.

Mr. C. Baker, 244 High Holborn, has just issued a new classified list of second-hand instruments for sale or hire. The catalogue contains particulars and prices of more than fifteen hundred optical and other instruments and accessories offered at low prices. Every instrument is guaranteed to be in adjustment, having been put in order where necessary in Mr. Baker's workshops or in the works of the original makers.

Fifty volumes of the "Cambridge Manuals of Science and Literature" have now been published by the Cambridge University Press. Among the most recent additions may be mentioned "The Work of Rain and Rivers," by Prof. T. G. Bonney, F.R.S.; "Brewing," by Mr. A. Chaston Chapman; "The Individual in the Animal Kingdom," by Mr. Julian S. Huxley; "House-flies and How they Spread Disease," by Dr. C. G. Hewitt; and "The Psychology of Insanity," by Dr. Bernard Hart. We notice, too, that Mr. L. Doncaster's volume in the series, "Heredity in the Light of Recent Research," has reached a second edition, in which a chapter on heredity and sex has been added.

OUR ASTRONOMICAL COLUMN.

Gale's Comet, 1912*a*.—No. 4602 of the *Astronomische Nachrichten* contains new elements for comet 1912. A set by Mr. H. E. Wood puts the perihelion passage back to October 1·86, and reduces the inclination of the orbit to 51° 54′; another by Mr. Merfield agrees fairly well with that published by Dr. Ebell, who gives a new ephemeris, derived from corrected elements, from which the following is taken:—

Ephemeris, 12h. M.T. Berlin.

1912	α (true) h. m.	δ (true) ° ′	log *r*	log Δ	Mag.
Oct. 13	15 43·4	+ 8 27·1	9·8673	0·0454	6·3
15	15 46·2	+10 28·3			
17	15 48·7	+12 23·9	9·8806	0·0588	6·4

It will be observed that this ephemeris gives the declination for October 13 nearly 1° more northerly than that we gave, from the earlier ephemeris, last week; the calculated magnitude is also considerably fainter. An observation by M. Gonnessiat at Algiers on September 26 gave the magnitude as 8·0.